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Capt. Kenneth Earhart Receives Presidential Medal in Djibouti

By Darnell Gardner, Naval Medical Research Unit No. 3, Cairo

On May 26, during a ceremony at the Djiboutian Ministry of Health, Capt. Kenneth Earhart, Commanding Officer of U.S. Naval Medical Research Unit No. 3 (NAMRU-3), was presented the "Medaille de Chevalier dans l'Ordre National du 27 Juin." Earhart was presented the decoration by the acting Head of State, Prime Minister Dileita Mohamed Dileita, for his support of the Djiboutian Ministry of Health.

While under Earhart's leadership, NAMRU-3 partnered with the Djiboutian Ministry of Health to conceptualize and train staff for its first-ever National Institute of Public Health to carry out the diagnosis of potential epidemics and the follow-up of pathogenic agent resistance.

"In the name of the Djiboutian government, we would like to express our sincere thanks for NAMRU-3's contributions. It provided outstanding support during a potential outbreak of avian influenza in April 2006 and cholera in January 2007. NAMRU-3 joined with our National Institute of Public Health to support public health capacity and provide much-needed training to our laboratory technicians," stated Prime Minister Dileita.

From left to right: His Excellency Abdallah Abdillahi Miguil, Capt. Kenneth Earhart, Prime Minister Dileita Mohamed Dileita, Ambassador James Swan, and Rear Adm. Brian Losey. Photos by Darnell Gardner.

Also present in the contingent of U.S. and Djiboutian officials were the Minister of Health, His Excellency Abdallah Abdillahi Miguil; U.S. Ambassador James Swan; Combined Joint Task Force – Horn of Africa Commander Rear Adm. Brian Losey; Camp Lemonnier Commanding Officer Capt. Darius Banaji; and U.S. Agency for International Development/Djibouti representative Ms. Stephanie Funk.

The presidential medal, which in English is "the National Order of June 27," was established in commemoration of the Republic of Djibouti's national day of independence in 1977. The medal recognizes the role Earhart and the staff of NAMRU-3 have played in strengthening the public health infrastructure in Djibouti, which is a part of the greater partnership between the U.S. and Djibouti.

Newsletter is One Year Old

The inaugural issue of *NMR&D News* was published in July 2009. In the past year, we've proudly covered changes of command, prestigious awards, groundbreaking of new facilities and cutting-edge research and development . Thanks to everyone who took the time to write articles; we're looking forward to more great stories in the year ahead! Please send comments and suggestions to soni.fitzhugh@med.navy.mil.

In this issue:

Commanding Officer's Message

Greetings,

We have the most incredible people working in our enterprise. As I review this issue I am impressed with our outreach beyond the walls of our facilities. NAMRU-3's recognition for their partnership with the Djiboutian Ministry of Health in developing the first National Institute of Public Health there. NMRC hosting health officials from Equatorial Guinea and NAMRL hosting the Israeli AF Surgeon General. NAMRU-SA actively participating in the CNO's strategic studies group focused on operating in the age of hypersonics and directed energy technologies. NMRCD's recent meeting with junior civilian researchers from Peru. NHRC/EHEL co-sponsoring the toxicology and risk assessment conference and working closely with DoD to bring together Federal, state and local agencies to focus on biofuels. As women prepare to join the submarine force, NSMRL will focus more research on health and operational issues. NAMRU-2 Detachment Singapore is leading the way in studying environmentally friendly mosquito controls as they work with Navy Regional Center Singapore Public Works Department to evaluate mosquito trapping devices. These are just a few examples of the outstanding outreach we do. Our enterprise – a global community of dedicated people – is making a difference in this world. Thank you for all you do every day.

Commanding Officer sends,
Richard L. Haberberger, Jr.
CAPT, MSC, USN

Cairo Lab Welcomes New Commanding Officer Capt. Wilkening

By Darnell Gardner, Naval Medical Research Unit No. 3, Cairo

U.S. Naval Medical Research Unit No. 3 (NAMRU-3) held a Change of Command Ceremony June 3 in Cairo, Egypt.

Incoming NAMRU-3 Commanding Officer Capt. Robin Wilkening, who served as the first Director for Public Health Services at Naval Medical Center, Portsmouth, and later as the Executive Officer, Expeditionary Medical Facility Kuwait and Naval Health Clinic Charleston, relieved Capt. Kenneth Earhart, who retired after twenty-two years of Naval service.

Wilkening is NAMRU-3's first female Commanding Officer since the research unit's establishment in 1946.

"NAMRU-3 is known throughout the world as a famous medical research laboratory, and I pledge to work diligently as the new Commanding Officer," Wilkening said.

"Capt. Wilkening comes to NAMRU-3 as a proven leader with a stellar reputation throughout Navy Medicine. She is an effective leader of the highest caliber who will care not only for mission requirement, but she will care for each member of the NAMRU-3 team," said Rear Adm. Eleanor Valentin, Commander, Navy Medicine Support Command, who spoke at the ceremony.

H.E. Margaret Scobey, U.S. Ambassador to Egypt, and Dr. Nasr El Sayed, Undersecretary and Assistant Minister of Health, welcomed Wilkening. Ambassador Scobey charged her with continuing to contribute to U.S. Government relations in the region through cooperative research agreements in Egypt and neighboring countries.

Wilkening's decorations include the Meritorious Service Medal with two gold stars and the Defense Meritorious Service Medal.

Capt. Kenneth Earhart, left, and Capt. Robin Wilkening, right, cut the cake at the reception after the change of command ceremony. Photo by Darnell Gardner.

NAMRU-SA Supports Chief of Naval Operations Strategic Studies Group

By Norman Barsalou, Naval Medical Research Unit - San Antonio

Hollywood producers are not the only folks thinking about futuristic weapons like lasers, high-powered microwaves or electromagnetic railguns. The Chief of Naval Operations (CNO) Strategic Studies Group (SSG) XXIX is also thinking about those things and, more importantly, about the less glamorous aspects of these weapons like logistics, training, procedures and even medical planning. The CNO directed this year's SSG with the topic of "Operating in the Age of Hypersonics and Directed Energy (DE)" technologies in the 2020-2025 timeframe. Members of the Naval Medical Research Unit San Antonio (NAMRU-SA), Norman Barsalou and Randal LeBlanc, participated in the CNO SSG Directed Energy Bioeffects Workshop and the CNO SSG Plenary Session chaired by Adm. (Ret.) James R. Hogg, Director, SSG at the Naval War College, Newport, R.I. May 25-26.

Many exciting developments are occurring on the science and technology front for directed energy weapons; the Air Force's Airborne Laser (ABL) shot down a ballistic test missile in February and the Navy has decided to invest in DE weapons technologies with the Office of Naval Research's (ONR's) Directed Energy Weapon Future Naval Capability. The SSG, based in Newport, R.I., was established by the CNO in 1981 to "generate new and revolutionary naval war concepts." The group takes its tasking from the CNO and is responsible for activities that can be characterized as "Operational Research and Concept Generation Center" for the future naval warfare concepts.

The Office of Naval Research's Maritime Laser Demonstration concept. Photo provided by armybase.us.

The SSG had much to consider, as DE weapons and their constituent technologies have been slowly advancing through the use of concept demonstrators like the previously mentioned ABL and the Army's former Tactical High Energy Laser (THEL). THEL has demonstrated a capability to shoot down multiple salvos of artillery rockets by using the energy in a laser beam to detonate the explosives-laden rockets.

The Navy has entered into the DE weapons arena with two currently funded projects, the Laser Weapon System (LAWS), executed by NAVSEA's PMS-405, and the ONR's Maritime Laser Demonstration (MLDS).

LAWS has been reported as having successfully engaged a drone in flight during an over-the-water engagement at San Nicholas Island, Calif. Besides accounting and planning for the futuristic technologies that these DE weapons will require, the group also identifies key issues requiring solution before the Navy can use these DE systems, and this is where the participants from NAMRU-SA contributed.

The SSG wanted to know about all of the issues raised by DE systems and other requirements that are levied on any service that introduces new weapons and concepts into the battlespace. Not all these issues are technological, like those regarding the legal, medical and treaty implications of potentially game-changing systems to project lethal force. Concerns and requirements for combatant forces to understand and possess the methods and means to mitigate personnel injuries from such weapon systems are the concerns being addressed by NAMRU-SA.

Navy Reservists Provide Humanitarian Assistance in Haiti

The U.S. Navy Reserves deployed a Medical Readiness and Training Exercise (MEDRETE) team to the town of Les Cayes in support of Joint Task Force-Haiti May 8-22, 2010. The MEDRETE was formed as part of U.S. Southern Command's Theater Security Cooperation activities that include humanitarian assistance to this country.

The Assistant Officer-in-Charge of the MEDRETE was Lt. Cmdr. Glenn Buni from Naval Medical Research Center's Advanced Medical Development Program Office. He led over 40 U.S. Navy medical personnel on this mission and coordinated the combined operations of augmenting U.S. Army, UN-Uruguay and Haitian national staff which resulted in a successful humanitarian assistance effort that recorded close to 10,000 patient visits during the 10-day exercise.

EHEL Co-sponsors Toxicology and Risk Assessment Conference

On April 26-29, Naval Health Research Center Detachment, Environmental Health Effects Laboratory (EHEL), Wright Patterson Air Force Base, Ohio, co-sponsored the 2010 Toxicology and Risk Assessment Conference (TRAC) in Cincinnati, Ohio. EHEL worked closely with Department of Defense and other Federal organizations to plan and organize this conference, bringing together Federal, state and local agencies as well as academic, nonprofit and private sector institutions. Featured topics included a workshop on risk assessment practice, applications of computational toxicology for improving risk assessment practice, dermal toxicology, and the toxicology and risk assessment of biofuels.

"EHEL has been involved as a sponsor of TRAC for 20 years. This is a valuable forum for us to interact with other toxicology and risk assessment professionals and share our work. This year we were happy to bring together experts on one of our most important current efforts, risk assessment of alternative fuels," said Lt. Cmdr. Michael Stockelman, Director of Research Operations at EHEL.

The Navy and Air Force have active programs to develop alternative fuels. For each alternative fuel in development, permissible exposure levels need to be established to protect service members who may experience inhalation and skin exposure on a daily basis. EHEL is collaborating with the Air Force's Alternative Fuels Certification Office, as well as the Naval Air Warfare Center Aircraft Division and the Navy and Marine Corps Public Health Center, to use a variety of tests to determine how the new fuels compare to kerosene fuels already in use.

"The whole field of alternative fuels is so new that we don't just have to establish health and safety standards for each fuel that may be used. We even have to design a strategy for making those determinations. That way every fuel developed by every service will be qualified by the same criteria," said Lt. Vishwesh Mokashi, a Navy biochemist leading the effort at EHEL.

EHEL also presented several projects. Dr. Michael Gargas presented the workshop "Physiologically Based Pharmacokinetic (PBPK) Models in Risk Assessment." Chet Gut earned second place in the student poster competition for "Hyperbaric Oxygen in the Prevention of Carbon Monoxide-induced Delayed Neurological Sequelae in Sprague-Dawley Rats (Rattus norvegicus)." Ryan Adkins received a special mention in the student poster competition for "Microbiological Characterization and Capacity of Afghanistan Sand." Lt. Cmdr. Stockelman co-chaired the session "Toxicity and Risk Assessment of Bio-Based Alternative Fuels," which featured speakers from the Air Force Research Laboratory, University of Georgia and U.S. Environmental Protection Agency.

Lt. Vishwesh Mokashi, Ph.D., monitors a jet fuel atmosphere being tested for occupational exposure safety at the Environmental Health Effects Laboratory.

New Ensign Bound for Uniformed Services University

Sajeewane Manjula Ekanayake of NMRC's Infectious Diseases Directorate, Viral and Rickettsial Diseases Department, was commissioned an Ensign in the U.S. Navy in a ceremony at NMRC. Ekanayake will begin studies at the Uniformed Services University of the Health Sciences in July. She is pictured (left) with Capt. Kevin Porter (right), director of the Infectious Diseases Directorate. *Photo by Phil Collins.*

NHRC Awarded U.S. Patent for Medical Inventory Management Tool

A Navy Medicine research team invented a unique computer-based management tool for medical planners to better estimate supplies required to support combat, humanitarian and peacekeeping missions.

In conventional military operations it is challenging to accurately estimate the medical supplies necessary to adequately supply military medical personnel in the field, especially in combat situations. Researchers from the Modeling and Simulation Group at the Naval Health Research Center (NHRC) in San Diego invented a computer program that enables a user to identify specific injuries and illnesses and then determine the medical tasks required to treat each patient and determine the supplies and equipment required to perform each task. This patient-generating model projects the frequency of specific injuries and illnesses likely to occur in a particular theater of operations.

"Casualty stream data, known or estimated, is married to medical tasks and the supplies used therein to determine what's needed in a particular theater of operations. We can use predefined operational scenarios like 'Northeast Asia' or 'Heavy Battle Intensity' or a specific scenario constructed by the user. Then this tool can estimate the medical supplies needed to carry out medical care at a specific level of care, for example in a triage situation or in a forward operating room," said Dr. Paula Konoske, Department Head, and one of the inventors on the team. "This planning tool has the potential to calculate the medical needs for military operational deployments and for training purposes."

"We have completed exercises with this program and achieved substantial reductions of up to 30 percent in the number of items and weight of specific supply blocks," Konoske added.

"Dr. Konoske and her team now routinely conduct medical supply optimization studies for the Marine Corps, Navy and Air Force – anyone that needs to be light and fast. They are also involved in efforts to optimize supply sets for humanitarian and disaster relief missions," said Dr. Karl Van Orden, Director of Research and Development at NHRC.

The program includes selected levels of care such as First Responder, Battalion Aid Station, Forward Resuscitative Surgery/Shock Trauma Platoon, Surgical Company, Small Ship/Independent Duty Corpsman, Submarines, Landing Ship and Aircraft Carriers. It also includes medical facilities where a patient will receive treatment such as triage, operating room, wards, x-ray and laboratory, battle dressing station, portable medical locker, first-aid boxes, emergency response kits, junior emergency response kits and dental.

A hospital corpsman cleans a Marine lance corporal's facial wounds. NHRC's inventory management tool will help medical planners ensure that doctors, nurses, and corpsmen have the supplies they need. Photo by Cpl. Michael J. Ayotte.

Health Officials from Equatorial Guinea Tour NMRC

Dr. Gloria Nseng Nchama, Director of the National Malaria Control Program, Equatorial Guinea Ministry of Health and Social Welfare, and Dr. Ramona Mba Andeme, Chief Officer for the Continental Region, toured NMRC as part of the U.S. Department of State International Visitors Program. Equatorial Guinea has allocated considerable revenue to malaria control. Drs. Nchama and Andeme hope to become updated on malaria vaccine developments and acquainted with IRB review, management and approval of human subjects research and the Spanish language modules for human research protection education and training offered through CITI.

Navy Medicine Researcher Shares U.S. Patent for New Vaccine

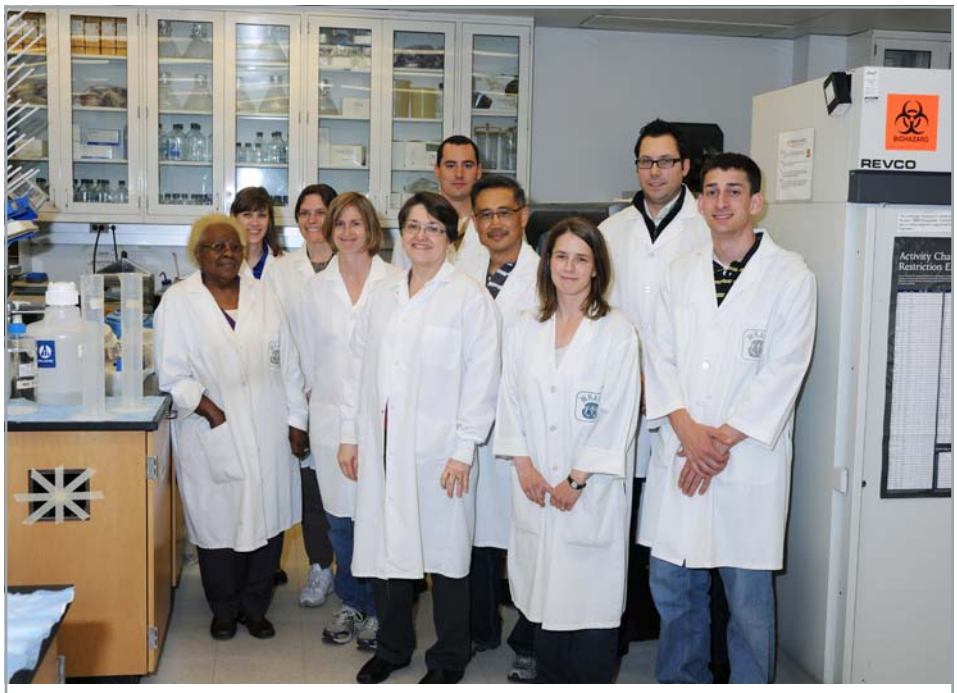
A Navy Medicine researcher will share a U.S. patent for her work in developing a vaccine against diarrheal disease. Dr. Patricia Guerry of the Naval Medical Research Center's Infectious Diseases Directorate is one of two inventors to develop a promising novel vaccine against *Campylobacter jejuni*. Infectious diarrhea has historically been a substantial cause of illness for deployed service members and continues today.

"High-tempo operations require the greatest level of physical and mental performance, often under environmental conditions marked by poor sanitation which in turn is associated with high rates of acute gastrointestinal illness that can temporarily incapacitate the warfighter," said Capt. Stephen Savarino, head of the joint Army/Navy Enteric Diseases Research Program. "Effective countermeasures require preventive vaccines against the most common causes of diarrhea and dysentery."

"Campylobacter is a food-borne illness and sources of the disease include contaminated water, dairy and poultry products," said Guerry. "Even when a Campylobacter illness is recognized and antibiotics are started, it can take another few days for relief of all symptoms. In military populations the illness can dramatically impair job performance. Moreover, it can trigger a range of serious health problems that occur after the acute infection. This vaccine is designed to stimulate an immune response in the body that prevents Campylobacter diarrhea and its sequelae."

There currently are no licensed vaccines against this disease. but this breakthrough has paved the way for testing in humans with a Phase 1 clinical trial projected for 2012-2013.

Guerry and her collaborator applied a conjugate approach to *C. jejuni* and this vaccine conferred full protection in a laboratory model, providing an early proof of the vaccine's potential. Capsule conjugate vaccines have been one of the most successful modern vaccine approaches. Many respiratory pathogens coat their surface with a polysaccharide or sugar capsule. Chemical conjugation of the capsule to a protein enhances its immunogenicity and such conjugate vaccines provide robust protection against a number of mucosal pathogens. *C. jejuni* is very unusual for an enteric pathogen in that is also expresses a polysaccharide capsule.



Dr. Patricia Guerry (fifth from left) and her Naval Medical Research Center team. Photo by Phil Collins.

Greetings from the NMRC Ombudsman!

Summer is here! Time for summer camp, grilling, vacations and fun in the sun. We hope everyone will take advantage of the summer months to relax, catch up with friends and family and get away with the kids. We also hope that everyone will remain vigilant and take appropriate safety precautions for all of the various activities you plan to do.

Vacation Time: When planning a vacation, check out Military One Source to get a full list of vacation opportunities. There are great, affordable facilities located all over the country that military personnel and their families can take advantage of year-round.

For those who are not able to get away this summer, there are also great opportunities to take a "staycation." If you have moved to a new duty station and haven't had a chance to see the sites in your area, a staycation may be the perfect choice for you and your family. Remember, when you take a staycation, act like a tourist and enjoy your region to the fullest. Don't make it an excuse to work around the house or catch up on errands. Check out these tips at Military One Source and have fun!

Military Family Award Program: Are you part of an outstanding military family? This is your chance to boast about your family's achievements or those of an outstanding family you know. The National Military Family Association's Military Family of the Year Award recognizes strong military families who embrace their service to the United States, are role models in their community, and understand that together they are stronger. Nominate yourself or someone you know at the Military Family website.

If you need information on these or other resources, please contact me at 217-722-4981 or angela.prouty@med.navy.mil.

Angela Prouty, Ombudsman, NMRC

NAMRU-2 Eco-friendly Mosquito Control Study Creates a Buzz

By Sandra F. Maynard, Naval Medical Research Unit No. 2, Singapore

Few enemies are more adaptable, resilient and pervasive than mosquitoes. Since 1897, when mosquitoes were first implicated as disease vectors, scientists have strived to develop methods to reduce mosquito-borne diseases. The most reliable method to manage such diseases continues to be mosquito control. In addition to public education campaigns to eliminate mosquito breeding areas, Singapore, a modern city-state, battles *Aedes spp.* mosquito populations with regular insecticide fogging to decrease outbreaks of endemic dengue and, since 2008, chikungunya fever. Despite improvements in mosquito control methods, including advanced insecticides, dengue has emerged as a worldwide problem only since the 1950s according to the U.S. Centers for Disease Control. With increased environmental awareness, mosquito control methods that minimize widespread insecticide use are in demand.

Naval Medical Research Unit No. 2 (NAMRU-2) Detachment Singapore is leading the way in environmentally friendly mosquito control in Southeast Asia. NAMRU-2 scientists, in collaboration with Navy Region Center Singapore Public Works Department, recently deployed mosquito trapping devices with rechargeable batteries in the Sembawang housing area in Singapore. The objective of this study is to evaluate the effectiveness a multi-device 'trap line' to control mosquito populations. The ten-week study will evaluate commercially available mosquito traps to determine how effective they are as a barrier to mosquito species found in the area. The study will also provide data to determine whether these devices can be used as an eco-friendly replacement for insect fogging, which can harm friendly insects and promote insecticide resistance in the mosquito populations.

With almost 90 inches of rainfall a year, temperatures up to 96 degrees and high humidity, Singapore provides a challenging environment for the mechanical mosquito trapping devices. Earlier trials in 2009 resulted in modification of the traps for the severe tropical marine environment that is common throughout Southeast Asia.

NMRCD Scientists Meet with Peruvian Ministry of Health

By Dr. Carlos Sanchez, Naval Medical Research Center Detachment - Peru

Collaboration with partners is a critical component of successful research. This is especially true for military research institutions in foreign countries, where the periodic rotation of officials requires constant updating. Navy Medical Research Center Detachment (NMRCD) has been collaborating with their Peruvian counterparts since 1983. NMRCD maintains projects with government and private research institutions in Peru and other countries in the region, including the Peruvian Ministry of Health (MOH). Over the years, the MOH has become the most important collaborating research office for NMRCD, currently accounting for 40 percent of NMRCD´s publications and 55 percent of active protocols. In May, personnel from NMRCD met with their counterparts from the MOH General Directorate of Epidemiology (DGE) to discuss a common work plan for collaborative activities between both institutions.

NMRCD and Peruvian Ministry of Health officials discussed collaboration between the two institutions.

The one-day session began with history and background information on both NMRCD and DGE. Junior researchers were introduced to the vision and mission of both institutions.

DGE is the office of the MOH responsible for maintaining epidemiological surveillance of reportable diseases, detecting outbreaks, and analyzing information regarding the health status of the population in Peru.

Representatives from NMRCD´s five departments (Virology, Bacteriology, Parasitology, Entomology and Emerging Infections) were matched with their counterparts in DGE´s two Executive Directorates (Surveillance Epidemiology and Public Health, and Sanitary Intelligence). Nine working groups were formed, including influenza, vector-borne diseases, zoonotic diseases, emerging and re-emerging infections, vaccine preventable illnesses, and sexually transmitted diseases. Each work-

Continued on page 8

Israeli Air Force Surgeon General Visits Navy Aerospace Lab

Dr. Joseph F. Chandler (right) provides a Fatigue Laboratory brief to Israeli Air Force Surgeon General Col. Gil Hirschhorn (left).

Israeli Air Force Surgeon General Col. Gil Hirschhorn visited the Naval Aerospace Medical Research Laboratory (NAMRL) May 24 during a tour of Naval Air Station Pensacola. NAMRL was one of several aeromedical institutions on Hirschhorn's itinerary during a U.S. visit to gain insight into the U.S. military's approach to aerospace medicine. The morning began with a brief from NAMRL Officer in Charge Cmdr. Rita Simmons outlining Navy Medicine's structure and core areas of research and development, followed by an overview of NAMRL's mission, history, unique research capabilities and technology transfer accomplishments. NAMRL Scientific Director Dr. Richard Arnold briefed Hirschhorn on NAMRL's core competencies and emphasized the importance of using aeromedical mishap causal factors as drivers of research and development projects to ensure alignment of NAMRL efforts with fleet needs. The visit concluded with briefs from NAMRL Principal Investigators Lt. Marc Taylor, Dr. Jeffrey Phillips and Dr. Joseph Chandler accompanied by a tour of NAMRL's Psychophysiology, Hypoxia, and Fatigue Laboratories.

NMRC's 2010 Lecture Series in Clinical Investigation Continues

The NMRC 2010 lecture series in clinical investigation featured Dr. Leslie Ball, Director, Division of Scientific Investigations (DSI), Office of Compliance, Center for Drug Evaluation and Research, for the Food and Drug Administration June 25. She discussed her role in developing a risk model for selecting clinical trial sites for inspection, collaborating with the European Medicines Agency and other international regulatory authorities, developing approaches to inspecting electronic data, and instituting process improvements for enforcement actions.

Dr. Ball graduated with a B.S. in Biology from Georgetown University. She received her M.D from Georgetown University School of Medicine, where she also completed a residency in Pediatrics. She completed a fellowship in Pediatric Infectious Diseases at the Walter Reed Army Medical Center and served as a pediatrician at the U.S. Naval Hospital, Subic Bay, Republic of the Philippines, in private practice in Maryland, and in the Department of Pediatrics at the National Naval Medical Center, Bethesda.

These one-hour lectures will occur every three to four weeks from January – November in the Benkhe Auditorium, Building 503, NMRC/WRAIR, presented by distinguished speakers from CDER, CBER, the pharmaceutical industry, a research volunteer advocacy group, NMRC and WRAIR. Human Research Protection Training credit will be offered to attendees.

Collaboration in Peru

Continued from page 7

ing group was required to establish research priorities of common interest to DGE and NMRCD. A list of proposed activities was drafted based on this priority list.

Personnel from both institutions will meet regularly over the next year to ensure the work plan is effective and continues to reflect the priorities of NMRCD and the MOH. This collaborative approach is key to future successful research initiatives and ensures a long-standing mutually beneficial relationship between Navy Medical Research and the government of Peru.

Retirement Ceremony for Cmdr. Linda Byrnes

Cmdr. Linda Byrnes concluded a distinguished 28-year Navy career in a ceremony held at NMRC June 7, 2010. An industrial hygiene specialist, her final tour of duty was as Director of Safety for NMRC and the Walter Reed Army Institute of Research. Her personal decorations include the Meritorious Service Medal (two awards), Navy/Marine Corps Commendation Medal (four awards) and the Navy/Marine Corps Achievement Medal.

Photo: Cmdr. Linda Byrnes (left) accepts her certificate of retirement from NMRC XO Capt. Eileen Villasante. Photo by Phil Collins.

San Antonio Lab Hosts Force Health Protection Program Review

By Lt. Leedjia Svec, Ph.D., Naval Medical Research Unit - San Antonio

The Naval Medical Research Unit San Antonio (NAMRU-SA) hosted the Office of Naval Research (ONR), Force Health Protection (FHP) Program Review Meeting June 2-4 at Brooks City-Base, Tex. The meeting started with the post-traumatic stress disorder working group, which discussed current directions in PTSD, traumatic brain injury, sleep disorders and factors of resilience. The working group also discussed specific research, including simulation to reduce stress, identifying visual psychophysics that can be used in modern technology for diagnosis and treatment, the use of pharmaceuticals to reduce stress, and surveys of former prisoners of war.

The meeting continued with ONR's review of fourteen research areas associated with the combat casualty care and trauma resuscitation science programs. Thirty-one scientists, including military, civilian, university, and contract personnel, were in attendance to present their research programs and describe objectives and results.

Two NAMRU-SA research programs, "Test and Evaluation of Commercially Available Diagnostic Kits for Rapid Typing, Cross Matching, and Pathogen Identification in Whole Blood" and "Rapid Identification of Pathogenic Agents in Biological Samples Using Pulsed Laser Optoacoustic Spectroscopy with Targeted Nanoparticle Contrast Agents" were presented at this review.

On the final day of the meeting, Cmdr. Jim Patrey, Program Officer, ONR FHP, gave a snapshot of future PTSD, TBI, sleep disorder, POW surveys and hearing conservation opportunities. The feasibility of custom hearing protection for better auditory conservation was specifically discussed. This was followed by a tour of NAMRU-SA facilities during which participants were shown the command's specialized photo-acoustics and QUEST psychophysics capability, laser eye protection visual behavior modeling, radiofrequency, microwave and associated dental and biomedical research capabilities.

Scientists from the Air Force Research Laboratory, Human Effects Division also provided tours of Air Force laser laboratories.

Overall, it was a successful interaction of science, fleet, industry and academia.

Hosting the ONR program review was in keeping with Navy Medicine's mission of supporting the Chief of Naval Operation's goal to provide unparalleled research and development. This was a positive event and may lead to future ONR meetings being hosted in San Antonio.

NAMRL's Marc Taylor is Presented the Ashton Graybiel Award

By Renee Lojewski, Naval Aerospace Medical Research Laboratory

The Society of U.S. Naval Flight Surgeons presented Lt. Marc K. Taylor the Ashton Graybiel Award at the 81st annual Aerospace Medicine Association conference for outstanding contributions to the medical literature as evidenced by publications in the Aviation, Space, and Environmental Medicine Journal.

The Ashton Graybiel Award was initiated in 1991 in honor of Capt. Ashton Graybiel, who pioneered aviation medicine research. Dr. Graybiel's history includes service as the Director of Naval Research for the Naval School of Aviation Medicine and Research, which officially became the Naval Aerospace Medical Research Laboratory (NAMRL) in 1975. He consulted on many experiments undertaken by the school and was an acknowledged expert in the field of cardiovascular medicine. Graybiel is affectionately referred to as the "Father of Naval Aerospace Medical Research."

Taylor, channeling the innovative spirit of his predecessor, has done extensive research investigating interventions to enhance stress resilience and preserve performance during aviation-related as well as more traditional military training. These research endeavors led to four publications in the Aviation, Space and Environmental Medicine Journal, including: *Anger Expression and Stress Responses in Military Men; Trait Anxiety and Salivary Cortisol During Free Living and Military Stress; Stressful Military Training: Endocrine Reactivity, Performance and Psychological Impact*; and *Neurophysiologic Methods to Measure Stress During Survival, Evasion, Resistance, and Escape Training*.

Lt. Marc Taylor displays the Ashton Graybiel Award.

Who We Are - Naval Submarine Medical Research Laboratory

Submarine Research Lab Enhances Warfighter Performance

The Naval Submarine Medical Research Laboratory (NSMRL), based at the New London Submarine Base in Groton, Conn., is one of ten U.S. Navy Medicine Biomedical Research Labs around the world, and the only Department of Defense laboratory dedicated to research in submarine and diving medicine. NSMRL conducts research into undersea human systems integration, submarine survival and rescue, submarine medicine, diver bio-effects, hearing conservation, and situational awareness. All of the laboratory's efforts relate to its mission of protecting the health and enhancing the performance of today's warfighters. NSMRL works with government, industrial, and university partners in order to achieve its mission, including the Naval Undersea Warfare Center (NUWC), Naval Medical Center San Diego, NASA, NAVSEA Naval Experimental Diving Unit (NEDU), U.S. Army Research Institute of Environmental Medicine (USARIEM), University of Rochester, MIT, Sensimetrics, Lockheed-Martin, and others.

While there is not enough space to go into all of the ongoing research projects at NSMRL, there are several key projects to highlight in the Warfighter Performance Department. A series of projects focusing on the Navy diver have been executed by the department in the areas of safety and performance. Major projects are underway to improve performance capabilities of today's Navy diver. The Underwater Sound Localization study will determine the ability of human divers to localize underwater sound. This will allow for opportunities to improve underwater navigation and lay the groundwork for exploring the extent to which human underwater sound localization abilities can be artificially enhanced. The Diver Worn Monitor project is centered on the development and testing of an underwater noise monitoring device that will enable the Navy to implement a meaningful Diver Hearing Conservation Program.

NSMRL's focus on Human Systems Integration (HSI) integrates human factors with training, manpower, survivability and more by recognizing that HSI is a key factor in optimizing systems performance. One of the most exciting areas of research at NSMRL based on HSI has incorporated virtual worlds in the concept and design of the next-generation, high-performance periscope display. Using virtual world simulation, researchers can control several factors of the experiment design, including weather, lighting, equipment mishaps and more to facilitate integration of the operator into the system. Furthermore, this provides a platform for learning how we can enhance performance and utilization of technology into our submarine platforms.

Other efforts underway in the Warfighter Performance Department include investigating the effects of underwater sound on divers as part of a joint force protection project, using the 3-D localization ability of the human auditory system to aid in designing methods to improve accuracy and localization of sound by sonar operators, and evaluating neurophysiologic correlates of learning in team settings in an operational trainer.

NSMRL has been at the forefront of undersea biomedical research since its inception in 1942 and continues to innovate in operationally relevant areas, always focused on the warfighter. Our research continues to be directly transitioned to the fleet in the form of procedural changes, lab-supported products, or specifications for acquisition of systems.

NSMRL began as a two-man Medical Research Section of the submarine base in support of research on submarine sound problems. By the end of World War II the now Medical Research Department had expanded in size and scope to include research in night vision, color training and lookout training. In addition, the lab participated in selection of qualified personnel for the Submarine School. Later iterations of the lab changed its name to the Naval Submarine Medical Center in 1964 and to its present name in 1974 as a separate command. Currently, the lab has a full-time staff 13 Ph.D. and M.D. Senior Investigators, 4 M.S. Investigators, 10 Research and Engineering Support, 5 Divers, and 12 Operational Support personnel. NSMRL's diving facilities include 3 Hyperbaric Chambers, Dodge Pond (NUWC) and a dive boat, as well as acoustic facilities, including a 1000m3 Anechoic Chamber, a 140m3 Reverberant Chamber, and 10 Audio Testing Booths.

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